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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,517	04/16/2004	Steven Bailey	MS307681.01 / MSFTP622US	1944
27195	7590	10/11/2006	EXAMINER	
AMIN. TUROCY & CALVIN, LLP 24TH FLOOR, NATIONAL CITY CENTER 1900 EAST NINTH STREET CLEVELAND, OH 44114			EHICHIOYA, FRED I	
			ART UNIT	PAPER NUMBER
			2162	

DATE MAILED: 10/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/826,517	<b>Applicant(s)</b> BAILEY ET AL.	
	<b>Examiner</b> Fred I. Ehichioya	<b>Art Unit</b> 2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 - 31 is/are pending in the application.
- 4a) Of the above claim(s) 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 30 is/are rejected.
- 7) ☒ Claim(s) 19 and 25 is/are objected to.
- 8) ☒ Claim(s) 1 - 31 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

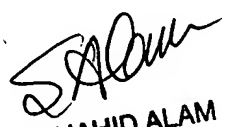
- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

  
**SHAHID ALAM**  
**PRIMARY EXAMINER**

### **DETAILED ACTION**

1. Claims 1 – 31 are pending in this Office Action.
2. Claims 1 –31 are subject to restriction /election.
3. Claims 1 – 30 are rejected.
4. Claim 31 is withdrawn.

### ***Election/Restrictions***

5. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1 – 30 are drawn to lock hierarchy arrangement wherein upon release of all child locks associated with a parent, then such parent lock is also release, classified in class 707, subclass 104.1.
  - II. Claims 31 are drawn to file protection system during performance of concurrent transactions, classified in class 707, subclass 204

The inventions are distinct, each from the other because of the following reasons:  
Inventions listed as Group I and Group II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention has separate utility as follows:

Group I has separate utility such as lock hierarchy arrangement wherein upon release of all child locks associated with a parent, then such parent lock is also release.

Group II has separate utility such as file protection system during performance of concurrent transactions. See MPEP § 806.05(d).

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Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

During telephone conversation with Bahid Sharifi (Reg. No. 45,828) applicant's representatives, on October 2, 2006 a provisional election was made with traverse to prosecute the invention of Group I, Claims 1 – 30. Claim 31 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 101***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 12, 20, 21 and 26 is rejected under 35 U.S.C. 101 because:

The claimed invention does not accomplish a "practical application" as forth in MPEP 2106 (II) (A); therefore non-statutory. To accomplish a practical application the claim must produce a "useful, concrete and tangible result." (State Street, 149 F.3d at 1373, 47 USPQ2d at 1601-02).

***Claim Objections***

7. Claims 19 and 25 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5 – 21 and 25 rejected under 35 U.S.C. 102(b) as being anticipated by Chan et al., "Chan" (U.S. Patent No. 6,108,654).

Regarding claim 1, Chan teaches a database management system comprising:

A lock manager that acquires a parent lock and a child lock on resource(s) of a database (column 6, lines 1 – 12: "Chan discloses a lock manager that manages and controls the allocation of locks in a system comprising of nodes; The nodes are translated to have root/parent node and leaf/child nodes"), the parent lock has a reference count of the child lock (col. 12, lines 34-44: "Chan discloses a reference counts that inherently include child lock"); and the parent lock is released upon release of child locks associated therewith (col. 12, lines 45-49: "When there are no more processes attached to a recovery domain, all persistent resources in that recovery domain may be cleaned up and de-allocated. The recovery domain data objects can thereafter be cleaned up and released in all lock manager instances"; Examiner interprets this process as "parent lock is released upon release of child locks associated").

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Regarding claim 5, Chan teaches the database management system of claim 1 further comprises a lock hierarchy designated by the lock manager (col. 11, lines 3-4).

Regarding claim 6, Chan teaches the database management system of claim 5, the lock hierarchy comprises at least one of a database lock, page lock, table lock and row lock (col. 3, lines 34-36).

Regarding claim 7, Chan teaches the database management system of claim 5 further comprising a page scan optimization that maintains a last child lock until a next one is acquired (col. 6, lines 13-18).

Regarding claim 8, Chan teaches the database management system of claim 1, the parent lock is an intent lock that protects resource at lower level (col. 6, lines 53-64).

Regarding claim 9, Chan teaches the database management system of claim 5, the child lock is at least one of an exclusive, update and shared lock at a level of the hierarchy (col. 6, lines 52-59).

Regarding claim 10, Chan teaches the database management system of claim 1, the reference count is performed upon completion of at least one of a scan, query or operation (col. 12, lines 36-38).

Regarding claim 11, Chan teaches the database management system of claim 1 further comprises a pointer that can guide a release operation from each child lock to a respective parent lock (col. 6, lines 13-18).

Regarding claims 12 and 19, Chan teaches a lock control method in a database management comprising:

defining a parent-child relationship among a plurality of locks in a lock hierarchy reference counting a child lock associated with parent lock (col. 6, lines 52-64: "Chan discloses a hierarchical lock levels of nodes that includes parent child relationships"), such that a parent lock maintains a count reference of respective child locks associated therewith (col. 12, lines 34-44: "Chan discloses a reference counts that inherently include child lock"); and

releasing a parent lock upon a release of all the respective child locks associated therewith (col. 12, lines 45-49: "When there are no more processes attached to a recovery domain, all persistent resources in that recovery domain may be cleaned up and de-allocated. The recovery domain data objects can thereafter be cleaned up and released in all lock manager instances"; Examiner interprets this process as "parent lock is released upon release of child locks associated").

Regarding claim 13, Chan teaches the method of claim 12 the defining act further comprising arranging a top-down lock granularity based on logical or physical granularities of objects stored in the database (col. 3, lines 45-50).



Regarding claim 14, Chan teaches the method of claim 12 further comprising pointing to a parent lock upon releasing a respective child lock associated therewith (col. 3, lines 45-50).

Regarding claim 15, Chan teaches the method of claim 12 further comprising reference counting child locks directly associated with the parent lock (col. 12, lines 36-38).

Regarding claim 16, Chan teaches the method of claim 12 further comprising maintaining a reference count within a structure of the parent lock (col. 12, lines 34-44).

Regarding claim 17, Chan teaches the method of claim 12 further comprising scoping the reference counting of a lock to a transaction.

Regarding claim 18, Chan teaches scoping the reference counting of a lock to a transaction (column 12, lines 34 – 35).

Regarding claim 20, Chan a database management system comprising:

Locking means for locking a resource on a database (col. 6, lines 1-6: “manager is a mechanism that manages and controls the allocation of locks in a system”), and

Means for determining a lifetime of the locking means (col. 6, lines 14-18: "the lock manager holds the lock for that process until the process indicates that the lock is no longer needed, at which time the lock can be validly released by the lock manager").

Regarding claims 21 and 25, Chan teaches a lock control method in a database management, comprising:

reference counting child locks associated with a parent lock to obtain a reference count (col. 12, lines 34-36: "The reference count is the number of local processes currently attached to the recovery domain in the local lock manager instance");

Releasing a child lock (col. 12, lines 45-49: "When there are no more processes attached to a recovery domain, all persistent resources in that recovery domain may be cleaned up and de-allocated. The recovery domain data objects can thereafter be cleaned up and released in all lock manager instances"; Examiner interprets this process as "parent lock is released upon release of child locks associated"); and

decrementing the reference count by a value of one (col. 12, lines 62-64: "the reference count decrements accordingly").

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 4, 22 – 24, and 26 – 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chan in view of Detlefs et al. "Detlefs" (Non Patent Literature "Lock-free reference counting).

Regarding claims 2 and 22, Chan discloses the claimed subject matter as discussed in claim 1. Chan does not explicitly teach zero value as claimed.

However, Detlefs discloses the parent lock is released upon the reference count attainment of a zero value (page, 191, col. Left column, Paragraph 2: "In order to maintain accurate reference counts, we would like to be able to atomically create a pointer to an object and increment that object's reference count, and to atomically destroy a pointer to an object and decrement its reference count. By freeing an object when and only when its reference count becomes zero, we can ensure that objects are not freed prematurely, but that they are eventually freed when no pointers to the object remain").

It would have been obvious to one of ordinary skill in the art at the time of present invention to combine the cited references because Detlefs teaching of decrementing "reference count to zero" would have allowed Chan's system to enable the root or

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parent node to be aware that there no sub-process/child lock associate therewith. This will allow a strong synchronization operation on pointers as suggested by Detlefs on page 198, section 7.

Regarding claims 3 and 23, Chan does not explicitly teach monitoring as claimed.

Detlefs disclose a lock monitoring system that monitors the reference count of child locks associated with the parent lock (page 196, section 5, left column, paragraph 3 "thus . . . exists").

Regarding claim 4, Chan teaches the database management system of claim 1, as each child lock is released the reference count of the parent lock decrements by a values of one (col. 12, lines 43-44).

Regarding claim 26, Chan teaches a computer-readable medium having stored thereon a data structure comprising:

A computer executable that acquires parent locks and child locks on a database resource (col. 4 lines 43-44), the parent lock with a reference count of the child lock (col. 12, lines 34-44).

Chan does not explicitly teach zero count as claimed.

However, Detlefs discloses the parent lock released upon the reference count attainment of a zero count (page, 191, col. Left column, Paragraph 2: "In order to

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maintain accurate reference counts, we would like to be able to atomically create a pointer to an object and increment that object's reference count, and to atomically destroy a pointer to an object and decrement its reference count. By freeing an object when and only when its reference count becomes zero, we can ensure that objects are not freed prematurely, but that they are eventually freed when no pointers to the object remain").

It would have been obvious to one of ordinary skill in the art at the time of present invention to combine the cited references because Detlefs teaching of decrementing "reference count to zero" would have allowed Chan's system to enable the root or parent node to be aware that there no sub-process/child lock associate therewith. This will allow a strong synchronization operation on pointers as suggested by Detlefs on page 198, section 7.

Regarding claim 27, Detlefs discloses the computer readable medium of claim 26 further comprising a further computer executable component that monitors the reference count (page 196, Left column, paragraph 3: "Thus . . . exists").

Regarding claim 28, Detlefs teaches the computer readable medium of claim 26 further comprising a further computer executable device that identifies a parent lock associated with a released child lock (Page 197, left column, "LFRCstore . . . it points")

Regarding claim 29, Detlefs discloses the computer readable medium of claim 26 further comprising probabilistic classification models (page 193 section 3 #4).

Regarding claim 30, Deflefs the computer readable medium of claim 26, the reference count is the count of direct child locks associated wit the parent lock (page 196, sect. 5, col. Left, paragraph 1: "the basic idea . . . pointers to the objects").

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**Conclusion**


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred I. Ehichioya whose telephone number is 571-272-4034. The examiner can normally be reached on M - F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Fred I. Ehichioya  
Patent Examiner  
Art Unit 2162

October 2, 2006

  
SHAHID ALAM  
PRIMARY EXAMINER